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MEFT REF: 230609001556

PROJECT DETAILS

Title	UPDATED ENVIRONMENTAL MANAGEMENT PLAN THE RENEWAL OF THE ENVIRONMENTAL CLEARANCE CERTIFICATE FOR THE ESTABLISHMENT OF A QUARRY & STONE CRUSHING PLANT ON THE MINING CLAIMS; 71427, 71428, 71429 & 71430 SITUATED AT OVIKOKOLA VILLAGE, RUACANA CONSTITUENCY, OMUSATI REGION, NAMIBIA.		
HEEC Reference	HEEC0152023		
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Report date	June 2023		
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ABBREVIATIONS

AIDS	Acquired Immuno-Deficiency Syndrome
Covid19	Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus
PR	Proponent's Representative
EA	Environmental Assessment
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
GG	Government Gazette
GIS	Geographic Information System
GN	Government Notice
GPS	Global Positioning System
HIV	Human Immuno-deficiency Virus
I&APs	Interested and Affected Parties
NHC	National Heritage Council
Reg.	Regulation
S	Section
TB	Tuberculosis

1 INTRODUCTION

Industrial minerals are geological materials which are mined for their commercial value, which are not fuel (fuel minerals or mineral fuels) and are not sources of metals (metallic minerals) but are used in the industries based on their physical and/or chemical properties. They are used in their natural state or after beneficiation either as raw materials or as additives in a wide range of applications. Typical examples of industrial rocks and minerals are limestone, clays, sand, gravel, diatomite, kaolin, bentonite, silica, barite, gypsum (soft calcium sulphate), and talc. Some examples of applications for industrial minerals are construction, ceramics, paints, electronics, filtration, plastics, glass, detergents and paper. The Ministry of Industrialization, Trade, and SME Development regulates manufacturing, including mineral beneficiation, cement production, and semiprecious stone processing. The lithology of area where the 4 adjacent mining claims; 71427, 71428, 71429 & 71430 occur has mineral deposits of alluvium, sand, gravel, calcrete and dunes. This shows that the mining sector has great potential to grow and continue to development in the country.

The Government of Namibia recognises that the exploration, mining and development of its mineral wealth could best be undertaken by the private sector. Government therefore focuses on creating an enabling environment through appropriate competitive policy and regulatory frameworks for the promotion of private sector investment coupled with the provision of national geo-scientific data bases essential for attracting competitive exploration and mining (Draft Minerals Policy of Namibia, MME).

It is with this background that **M. Shikongo's Investments Group One (Pty) Ltd** has decided to extract Industrial mineral resources in the form of aggregate & establish a stone crushing plant on the 4 adjacent mining claims ; 71427, 71428, 71429 & 71430 under EPL 8467 for commercial purposes. The main aim of the proposed mining activities is to supply aggregate for housing development and construction activities within the Omusati & Kunene Regions. The proponent has through extensive market research realised that the Omusati & Kunene Region and the surrounding developing towns such as Okahao, Opuwo, Tsandi, Ruacana and Outapi are experiencing shortages of aggregate and other raw construction materials; this has resulted in project delays due to limited supplies of raw construction materials.

However uncontrolled natural resource mining/ extraction has resulted in negative environmental effects in some areas of the country. This has been largely attributed to the fact that people were under no obligation to rehabilitate the affected areas and thus left behind large open pits/quarries that pose a danger to both humans and animals. From the point of view of the environmental impact created, industrial minerals (aggregate) mining is a relatively benign industry if it does not include further processing such as premixing/processing on site. There are no emissions besides those of the diesel powered earthmoving equipment utilised in its extraction and a small amount of blasting gases. Contamination of water resources is only likely in the event of petrochemical spillages from storage facilities and equipment, and these can largely be either prevented or cleaned up effectively. The major environmental impacts are of a visual nature, while in sensitive areas, sense of change of place and habitat destruction may become significant impacts. If the Environmental Management Plan is not adhered to open cast mining can do tremendous damage by destroying habitats. Drainage of water sources may be another serious problem, especially because the mining claims are located in an arid/semi-arid area.

M. Shikongo's Investments Group One (Pty) Ltd, hereinafter referred to as the proponent intends to carry out the following activity:

- **Environmental Assessment (EA) for the renewal of the Environmental Clearance Certificate for the establishment of a quarry & stone crushing plant on the mining claims; 71427, 71428, 71429 & 71430 situated at Ovikokola Village, Ruacana Constituency, Omusati Region, Namibia.**

The objective of the Environmental Assessment is thus needed to assess the potential social and environmental impacts associated with the proposed mining activities for industrial minerals (aggregate) as a construction raw material & stone crushing plant on the mining claims; 71427, 71428, 71429 & 71430 situated at Ovikokola Village, Ruacana Constituency, Omusati Region, Namibia, and also to formulate methods of rehabilitation of the quarries once the aggregate has been excavated.

The above is a listed activity in terms of the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012). In terms of the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012), the following listed activities in **Table 1** were triggered by the proposed project:

Table 1: List of triggered activities identified in the EIA Regulations which apply to the proposed project

Activity description and No(s):	**Description of relevant Activity**	**The portion of the development as per the project description that relates to the applicable listed activity**
Activity 3.1 (Mining and Quarrying Activities)	The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.	The proposed project includes the mining of industrial minerals (aggregate) as raw materials for construction purposes & stone crushing plant.
Activity 3.2 (Mining and Quarrying Activities)	Other forms of mining or extraction of any natural resources whether regulated by law or not.	The proposed project includes the mining of industrial minerals (aggregate) as raw materials for construction purposes & a stone crushing plant.

Activity description and No(s):	Description of relevant Activity	The portion of the development as per the project description that relates to the applicable listed activity
Activity 3.3 (Mining and Quarrying Activities)	Resource extraction, manipulation, conservation and related activities.	The proposed project includes the mining of industrial minerals (aggregate) as raw materials for construction purposes & a stone crushing plant.

1.1 The Scope of the Proposed Activities

The project involves conducting an EIA for the establishment of a quarry & stone crushing plant on mining claims; 71427, 71428, 71429 & 71430 situated at Ovikokola Village, Ruacana Constituency, Omusati Region, Namibia. The proposed mining area covers a total of about 71.468 Hectares.

The Proponent intends to extract Industrial mineral resources from the 4 adjacent mining claims for commercial purposes. The proposed mine will implement an open cast mining method which is one of the common methods used to extract minerals from the earth. The excavators will be used to access to remove the overburden and access the underneath ore bodies. The mined ore in form of aggregate will be sorted and loaded onto trucks for delivery as per customer requirements. The main aim of the proposed mining activities is to supply aggregate for housing development and construction activities within the Omusati & Kunene Regions. The proponent has through extensive market research realised that the Omusati & Kunene Region and the surrounding developing towns such as Okahao, Opuwo, Tsandi, Ruacana and Outapi are experiencing shortages of aggregate and other raw construction materials; this has resulted in project delays due to limited supplies of raw construction materials.

The demand for aggregate and concrete materials in the nearby developing towns and surrounding villages & settlements has been prompted by high demand of houses and an increase in housing development and other civil infrastructural development. The proposed project will have a cumulative economic impact to the Ovikokola village and surrounding towns; the project will employ about 20 permanent employees, two technicians, two operators, three heavy duty drivers and eight packers. About ten (10) casual workers from the as Ovikokola village will be employed on seasonal basis to load the aggregate. The lifespan of the project is not yet determined. The aggregate will be transported to different construction sites within the Omusati & Kunene and surrounding towns using tipper trucks.

1.1.1 Surface Excavation of Industrial Minerals - Construction aggregate mining

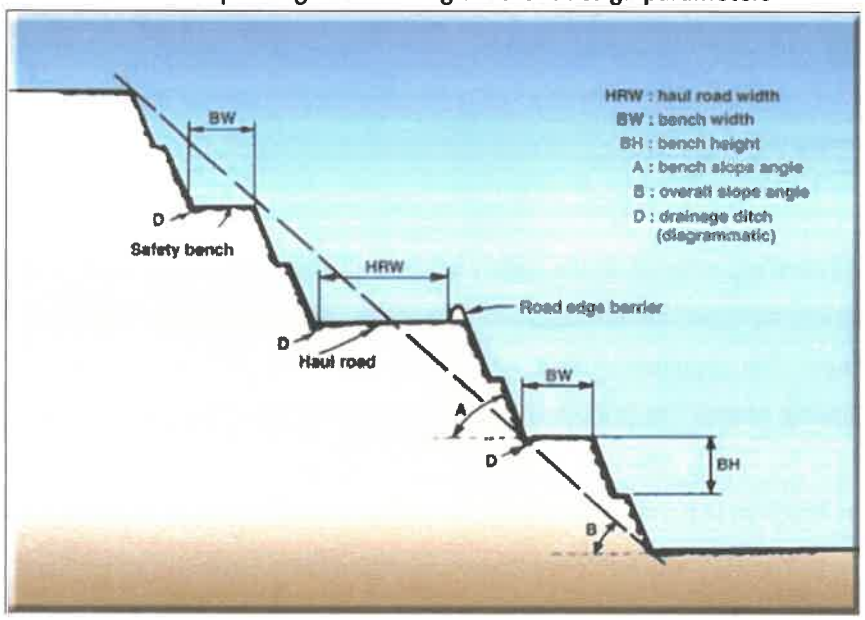
Quarry products, such as construction aggregate, are produced in a multi–stage processing operation that involves drilling and blasting, extraction, crushing and milling at the crusher site to be established within a suitably designated area to cater for all the 3 mining claim sites, where screening and classification of the construction aggregate will be done.

Since each mine site is unique in its mineral composition, concentration, and quantities, the most economical and profitable processing of the aggregate must be determined by the mine planners.

Construction aggregate mining is usually performed using open-pit mining, in which a series of stepped benches are dug deeper and deeper into the earth over time. To remove the aggregate, boring machinery is used to drill holes into the hard rock, and explosives are inserted into the drill holes to blast and break the rock. The resulting boulders are then ready for hauling; specialized haul trucks, conveyors, trains, and shuttle cars can all be used to haul the aggregate from the blasting site to the processing site. The excavated construction aggregate is then sent through a primary crusher, which is typically located very close to or sometimes in the pit. This primary crusher reduces the size of the ore from boulder to golf ball-sized rocks.

This mining operation can be classified as quarrying the open or surface excavation of industrial minerals-construction aggregate. Quarrying starts from the earth's surface and maintains exposure to the surface throughout the extraction period. For both access and safety, the excavation usually has stepped or benched side slopes as shown in Illustration 1 below.

Illustration 1: A simple diagram showing different design parameters



The availability of the resource is estimated to be sufficient to provide this mine with a lifespan of approximately 10 years. The proposed project will contribute to the local economy of the Ovikokola Village and surrounding areas such as Omakange and the Tsandi, Okahao & Outapi Towns.

Material will thus be excavated in layers in the benches of various depths. Mining will be done by Hydraulic excavators, Jack Hammer Drills, Compressors and loaders for loading of mineral into trucks, trippers and tractor/ trolleys. Mining machineries and transporting vehicles are deployed on contractual basis. There is no chemical processing plant at this site. There is only the crushing of the aggregate (industrial minerals) to smaller sizes as per the customer requirements and market demand to supply as a raw material for construction. The production (extraction) rate for the different quarries depends on their state of development. The first 5 years provides for production build up or development of the new quarry and thereafter production stays constant per annum.

An Environmental Management Plan (EMP) is one of the most important outputs of the EA process as it synthesises all of the proposed mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. Regular monitoring of environmental parameters is of immense importance to assess the status of environment during project operation. The knowledge of baseline conditions comes through monitoring of environmental parameters; the monitoring program will serve as an indicator for environmental conditions due to operation of the project. Monitoring is an important tool for the management, environmentalist, and policy makers to make changes in pollution control equipment, environmental policy to reduce the environmental impact of the mining operations. It is a decision-making tool for the state of environment carried out through periodic monitoring. Regular monitoring program of the environmental parameters is essential to consider the changes in the environmental quality over the period to comply environmental conditions necessary to save the environment. The environmental consultant (HEEC) will carry out biannual environmental audits during the lifespan of this aggregate (industrial minerals) mine. This EMP details the mitigation and monitoring actions to be implemented during the following phases of these developments:

- Industrial Minerals (aggregate) Mining & Stone Crushing Phase – the period during which the proponent, having dealt with the necessary legislative and administrative arrangements, appoints a contractor to engage in the extraction of Industrial Minerals (aggregate) from the project site to be transported to the Walvis Bay Port for commercial purposes;
- Transportation Phase- the period during which the proponent transports the Industrial Minerals (aggregate) from the quarry to the market/customers for construction purposes.

The rehabilitation of the quarries at the aggregate mining site once activities have ceased is highly recommended to ensure that the subject area assumes economically viable alternative land uses and not pose a drowning threat/injury to the livestock and locals making use of these communal lands; when the event occurs then some recommendations have been outlined in **Table 4 & 5.**

2 ROLES AND RESPONSIBILITIES

The proponent (M. Shikongo's Investments Group One (Pty) Ltd) is ultimately responsible for the implementation of the EMP, at the aggregate mining & stone crushing phase to the quarry rehabilitation phase of the aggregate mining on mining claims; 71427, 71428, 71429 & 71430 situated at Ovikokola Village, Ruacana Constituency. The proponent will delegate this responsibility as the project progresses through its life cycle. The delegated responsibility for the effective implementation of this EMP will rest on the following key individuals:

- Proponent's Representative;
- Environmental Control Officer; and
- Contractor (M. Shikongo's Investments Group One (Pty) Ltd).

2.1 PROPONENT'S REPRESENTATIVE

M. Shikongo's Investments Group One (Pty) Ltd, the proponent, should assign the responsibility of managing all aspects of this development for all development phases (including all contracts for work outsourced) to a designated member of staff, referred to in this EMP as the Proponent's Representative (PR). The proponent may decide to assign this role to one person for the full duration of these developments or may assign a different PR to each of the development phases – i.e., one for the Industrial Minerals (aggregate) mining & one for the quarry rehabilitation phase. The PR's responsibilities are as follows:

Responsibility	Project Phase
Making sure that the necessary approvals and permissions laid out in **Table 2** are obtained/adhered to	Throughout the lifecycle of this project
Suspending/evicting individuals and/or equipment not complying with the EMP	• Industrial Minerals (aggregate) mining & stone crushing • Transportation of Industrial Minerals (aggregate) • Quarry rehabilitation.
Issuing fines for contravening EMP provisions	• Industrial Minerals (aggregate) mining & stone crushing

	• Transportation of Industrial Minerals (aggregate) • Quarry rehabilitation.

2.2 ENVIRONMENTAL CONTROL OFFICER

The PR should assign the responsibility of overseeing the implementation of the whole EMP on the ground during the aggregate mining & quarry rehabilitation phases to a designated member of staff, referred to in this EMP as the Environmental Control Officer (ECO). The PR/ M. Shikongo's Investments Group One (Pty) Ltd may decide to assign this role to one person for all three activities or may assign a different ECO for each activity. The ECO will have the following responsibilities during the mining, operation, and rehabilitation phases of these developments:

- Management and facilitation of communication between the Proponent, PR, the contractors, and Interested and Affected Parties (I&APs) with regard to this EMP;
- Conducting regular inspections (recommended minimum frequency is once every six months) with respect to the implementation of this EMP (monitor and audit the implementation of the EMP);
- Assisting the Contractor in finding solutions with respect to matters pertaining to the implementation of this EMP;
- Advising the PR on the removal of person(s) and/or equipment not complying with the provisions of this EMP;
- Making recommendations to the PR with respect to the issuing of fines for contraventions of the EMP; and
- Undertaking an annual review of the EMP and recommending additions and/or changes to this document.

2.3 AGGREGATE MINING & QUARRY REHABILITATION CONTRACTOR

A contractor, in this case being the proponent, conducts the aggregate mining, stone crushing & quarry rehabilitation activities on mining claims; 71427, 71428, 71429 & 71430 situated at Ovikokola Village, Ruacana Constituency and is therefore automatically responsible for implementing all provisions contained within the relevant chapters of this EMP. The aggregate mining & quarry rehabilitation contractor will be responsible for the implementation of this EMP applicable to any work outsourced to subcontractors. **Table 3** applies to contractors appointed during the Industrial Minerals (aggregate) mining phase and **Table 4** to those appointed during the continuous quarry rehabilitation phase. In order to ensure effective environmental management, the aforementioned chapters should be included in the applicable contracts for outsourced work relating to the intended activities.

The tables in the following chapter (**Chapter 3**) detail the management measures associated with the roles and responsibilities that have been laid out in this chapter.

3 MANAGEMENT ACTIONS

The aim of the management actions in this chapter of the EMP is to avoid potential impacts where possible. Where impacts cannot be avoided, measures are provided to reduce the significance of these impacts.

The following tables provide the management actions recommended to manage the potential impacts rated in the scoping-level EA conducted for these activities. These management actions have been organised temporally according to project phase:

- Applicable legislation (**Table 2**);
- Industrial Minerals (aggregate) mining Actions (**Table 3**);
- Quarry rehabilitation Management Actions (**Table 4**); and
- Decommissioning phase management actions (**Table 5**).

The responsible persons from the proponents' team have assessed these commitments in detail and have committed to the specific management actions were indicated in the tables below.

3.1 ASSUMPTIONS AND LIMITATIONS

This EMP has been drafted based on the scoping-level Environmental Assessment (EA) conducted in September 2021, for the operation and management of the intended aggregate mining & quarry rehabilitation activities as represented in **Figure 2**. HEEC will not be held responsible for the potential consequences that may result from any alterations to the agreed course of action in terms of the intended activities on the 4 adjacent mining claims i.e., 71427, 71428, 71429 & 71430 at Ovikokola Village and the surrounding area.

It is assumed that labourers will be sourced mostly from the Ruacana area and that migrant labourers (if applicable) will be housed within established prefabricated accommodation facilities at the designated base camp within the Ovikokola Village as prescribed by the Traditional Authority.

3.2 APPLICABLE LEGISLATION

There are multiple legal instruments that regulate and have a bearing on good environmental management in Namibia. **Table 2** below provides a summary of the legal instruments considered to be relevant to the Industrial Minerals (aggregate) mining & quarry rehabilitation activities and the environmental assessment process.

Table 2: Legal provisions relevant to these activities

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
The Constitution of the Republic of Namibia as Amended	Article 91 (c) provides for duty to guard against "the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia." Article 95(l) deals with the "maintenance of ecosystems, essential ecological processes and biological diversity" and sustainable use of the country's natural resources.	Sustainable development should be at the forefront of management of the intended mining activities.
Environmental Management Act No. 7 of 2007 (EMA)	Section 2 outlines the objective of the Act and the means to achieve that. Section 3 details the principles of Environmental Management	The management of this project must be informed by the EMA.
EIA Regulations GN 28, 29, and 30 of EMA (2012)	GN 29 Identifies and lists certain activities that cannot be undertaken without an environmental clearance certificate. GN 30 provides the regulations governing the environmental assessment (EA) process.	**Activity 3.1 (Mining and Quarrying Activities)** The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992. **Activity 3.2 (Mining and Quarrying Activities)** Other forms of mining or extraction of any natural resources whether regulated by law or not. **Activity 3.3 (Mining and Quarrying Activities)** Resource extraction,

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
		manipulation, conservation and related activities.
Convention on Biological Diversity (1992)	Article 1 lists the conservation of biological diversity amongst the objectives of the convention.	The aggregate mining & quarry rehabilitation activities should consider the impact it will have on the biodiversity of the area.
Draft Procedures and Guidelines for conducting EIAs and compiling EMPs (2008)	Part 1, Stage 8 of the guidelines states that if a proposal is likely to affect people, certain guidelines should be considered by the proponent in the scoping process.	The EA process should incorporate the aspects outlined in the guidelines.
Namibia Vision 2030	Vision 2030 states that the solitude, silence and natural beauty that many areas in Namibia provide are becoming sought after commodities and must be regarded as valuable natural assets.	Care should be taken that the aggregate mining & quarry rehabilitation activities do not lead to the degradation of the natural beauty of the surrounding land area.
Water Act No. 54 of 1956	Section 23(1) deals with the prohibition of pollution of underground and surface water bodies.	The pollution of water resources should be avoided during aggregate mining & quarry rehabilitation activities.
The Ministry of Environment and Tourism (MET) Policy on HIV & AIDS	MET has recently developed a policy on HIV and AIDS. In addition it has also initiated a programme aimed at mainstreaming HIV and gender issues into environmental impact assessments.	The proponent and its contractor have to adhere to the guidelines provided to manage the aspects of HIV/AIDS. Experience with similar projects has shown that a significant health risk is created when migrant construction workers/labourers interact with local communities.
Local Authorities Act No. 23 of 1992	The Local Authorities Act prescribes the manner in which a town or municipality should be managed by the Town or Municipal Council. Sections 34-47 make provision for the aspects of water and sewerage.	Industrial Minerals (aggregate) mining & quarry rehabilitation activities have to comply with provisions of the Local Authorities Act.
Labour Act No. 11 of 2007	Chapter 2 details the fundamental rights and protections. Chapter 3 deals with the basic conditions of employment.	Given the employment opportunities presented by the Industrial Minerals (aggregate) mining & quarry rehabilitation activities, compliance with the law is essential.

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
Public and Environmental Health Act of 2015	This Act (GG 5740) provides a framework for a structured uniform public and environmental health system in Namibia. It covers notification, prevention and control of diseases and sexually-transmitted infections; maternal, ante-natal and neo-natal care; water and food supplies; infant nutrition; waste management; health nuisances; public and environmental health planning and reporting. It repeals the Public Health Act 36 of 1919 (SA GG 979).	Industrial Minerals (aggregate) mining & quarry rehabilitation activities are to comply with these legal requirements.
Nature Conservation Ordinance No. 4 of 1975	Chapter 6 provides for legislation regarding the protection of indigenous plants.	Indigenous and protected plants have to be managed within the legal confines.
Environmental Assessment Policy of Namibia (1995)	The Policy seeks to ensure that the environmental consequences of development projects and policies are considered, understood and incorporated into the planning process, and that the term ENVIRONMENT is broadly interpreted to include biophysical, social, economic, cultural, historical and political components.	This EIA considers this term of Environment.
Minerals (Prospecting and Mining) Act, 1992 (Act 33 1 of 1992)	To provide for the reconnaissance, prospecting and mining for, and disposal of, and the exercise of control over, minerals in Namibia; and to provide for matters incidental thereto, "mineral" means any substance, whether in solid, liquid or gaseous form, occurring naturally in, on or under any land and having been formed by, or subjected to, a	The intended activity involves the mining of aggregate to be supplied as a raw material for the construction industry/ commercial purposes.

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
	geological process, excluding -(c) subject to the provisions of subsection (2), soil, sand, clay, gravel or stone (other than rock material specified in Part 2 of Schedule 1) if they are bona fide required for purposes of – (i) agriculture, building works, fencing or road making; (ii) the manufacture of bricks and tiles;	
Soil Conservation Act 6 of 1969 Ministry of Agriculture, Water and Forestry	This Act covers the prevention and combating of soil erosion; the conservation, improvement and manner of use of the soil and vegetation; and the protection of water sources	Soils should not be polluted or left un-rehabilitated.

This EMP was formulated and compiled in accordance with the EIA Regulations.

3.3 PROJECT LOCATION

The proponent intends to mine industrial minerals (aggregate) & crush it as a construction raw material on the mining claims 71427, 71428, 71429 & 71430 situated at Ovikokola Village, Ruacana Constituency, Omusati Region, Namibia. The mining claims are situated at Ovikokola Village. The mining claims are accessible via a track which branch out for a few kilometres toward the north when using the C35 main road. Refer to the locality maps in **Figure 1 & Figure 2** for the locality of the 4 adjacent mining claims for the industrial minerals.

Figure 1: Locality map of Ovikokola Village (red pin), Ruacana Constituency, Omusati Region (HEEC, 2023).

MINING CLAIM AREAS

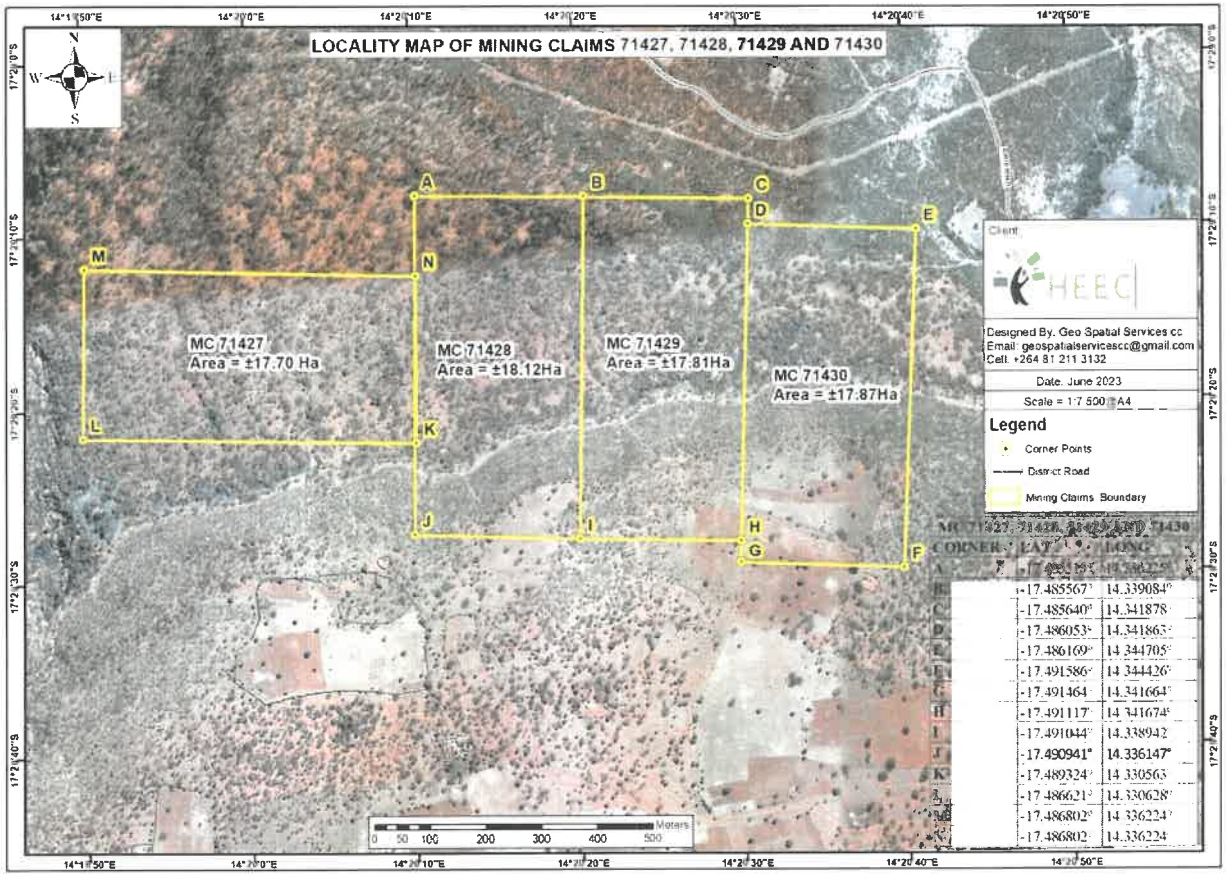


Figure 2: Locality map of the 4 adjacent mining claims 71427, 71428, 71429 & 71430 at Ovikokola Village, Omusati Region (HEEC, 2023).

3.4 AGGREGATE MINING & STONE CRUSHING PHASE

The PR should ensure that the management actions detailed in **Table 3** below should be adhered to during the operation of the quarry for Industrial Minerals (aggregate) mining & stone crushing activities and should be undertaken together with the mitigation measures in **Table 8** of the FESR.

Table 3: Industrial Minerals (aggregate) Mining Phase Management Actions

Aspect	Management Actions	Responsibility	Monitoring Agent (s)
Environmental Incidents	• The ECO on site shall maintain a register of all environmental incidents occurring as a result of the activities associated with the project. Environmental incidents that shall be recorded include (but are not limited to): ➢ Fires; ➢ Drowning; ➢ Accidents (e.g. traffic); ➢ Spills of hazardous materials, contaminating soil or water resources; ➢ Non-compliances with applicable legislation; and ➢ Non-compliances with this EMP. • Environmental incident reports shall include (as a minimum) a description of the incident, the actions taken to contain any damage to the environment, personnel, or the public, and the actions taken to repair / remediate any such damage.	-ECO	-ECO -MEFT, -MAW&LR -MHSS

Aspect	Management Actions	Responsibility	Monitoring Agent (s)
	• Additional measures shall be prescribed that may be required to remediate damage resulting from the incident and / or to prevent similar incidents occurring in the future.		
Traffic	• Ensure that road junctions have good sightlines. • Limit the type of vehicle (heavy trucks) allowed on site. • Adhere to the speed limit. If permissible, caution signs and 40 km/hr signs shall be placed at regulation distance from heavy vehicle crossing signs at the intersections of the access tracks and the C35 road. • Designate no-drive zones. • Implement traffic control measures where necessary by keeping a number plate register of all vehicles transporting aggregate at the site and restricting access to authorised contractors.	CONTRACTOR -ECO	-Roads Authority
Quarries/Industrial Minerals (aggregate) quarry & stone crushing site area on mining claims; 71427, 71428, 71429 & 71430 situated at Ovikokola Village, Ruacana Constituency	• Industrial Minerals (aggregate) should be sourced from quarries with a valid ECC. • The aggregate mining sites must be clearly demarcated by means of a perimeter stock-proof fence with a lockable gated entrance. • Industrial Minerals (aggregate) mining and resultant operations shall only take place within this demarcated area.	CONTRACTOR -ECO	-MME -MEFT, -MAW&LR

Aspect	Management Actions	Responsibility	Monitoring Agent (s)
	• A detailed photographic record of the demarcated mining areas, prior to any mining activities, shall be taken. These records are to be kept by the Proponent and PR for reference purposes during the rehabilitation of the site. • There will be **'No unauthorised access'** signs at the mining site gates until to restrict entry and/or harm to people not involved in the aggregate mining operations.		
EMP training	All workers at the site are to undergo EMP training that should include as a minimum the following: • Explanation of the importance of complying with the EMP. • Discussion of the potential environmental impacts of the intended Industrial Minerals (aggregate) mining and quarry rehabilitation activities. • Employees' roles and responsibilities, including emergency preparedness and response requirements. • Explanation of the mitigation measures that must be implemented when particular work groups carry out their respective activities. • The potential consequences of departure from specified operating procedures; and rewards for enhancing mitigation measures or avoiding negative environmental effects.	CONTRACTOR -ECO	-MME -MEFT, -MAW&LR -MHSS

Aspect	Management Actions	Responsibility	Monitoring Agent (s)
Fauna and Flora	• Prevent the destruction of protected tree species. • Encourage the regrowth and regeneration of trees with exposed roots at the site. • The excavation of the Industrial Minerals (aggregate) & stone crushing plant location should incorporate existing trees[1]. • The Contractor should compile a Tree Management Plan which should include the following as a minimum: o Trees if not already accounted for in an existing Geographic Information System (GIS), should be surveyed, co-ordinates/location incorporated into the Contractor's GIS, marked with paint (or other means so as to be readily visible) and protected; o Trees, which are impossible to conserve, need to be identified and their location recorded on a map; o The Contractor should apply to the relevant authority (Ministry of Agriculture, Water & Forestry) for a permit to remove these trees. o A list should be compiled of all trees to be removed detailing the location of the tree, the species as well as which trees will be planted to replace these. The nursery where these trees will be sourced from should also be included;	CONTRACTOR -ECO	-MME -MEFT, -MAW&LR

[1]a "tree" is defined as an indigenous woody perennial plant with a trunk diameter ≥150 mm

Aspect	Management Actions	Responsibility	Monitoring Agent (s)
	○ Each tree that is removed needs to be replaced with an indigenous tree species; ○ Some of these trees can be obtained at the nearest forestry office or at a commercial nursery such as the Forestry office in Outapi. Assistance can be sought from the nearest forestry office regarding nearby nurseries where additional trees may be bought and advice sought. • Only a limited width +/- 5 m on the side of the access roads may be partially cleared of vegetation. • Workers are prohibited from collecting wood or other plant products on or near the site. • No alien species may be planted on or within the existing site. • Prevent contractors from collecting wood and veld food such as amphibians, migrating birds, etc. during the Industrial Minerals (aggregate) mining phase. • Prevent contractors from fishing in the nearby ephemeral rivers or catching aquatic species.		
Lay-down areas and materials camp	Suitable locations for the contractors lay-down areas and materials camp should be identified with the assistance of the PR and the following should be considered in selecting these sites: • The areas designated for the services infrastructure should be used as far as possible.	CONTRACTOR -ECO	-MME -MEFT,

Aspect	Management Actions	Responsibility	Monitoring Agent (s)
	• Second option should be degraded land. • Avoid sensitive areas (e.g., wetlands/rivers/drainage lines)		
Hazardous waste	• All heavy-duty vehicles and equipment on site should be provided with a drip tray. • All heavy-duty delivery vehicles should be maintained regularly to prevent oil leakages. • Maintenance and washing of vehicles should take place only at a designated workshop area. • Workshops may be prone to hydrocarbon spillages that change the soil chemistry and may affect groundwater quality (only in severe cases). If fuel is stored on site, there is a possibility of spontaneous combustion that may lead to uncontrollable fires, groundwater, and soil contamination. • All hazardous substances (e.g., fuel etc.) or chemicals should be stored in a specific location on an impermeable surface that is bunded - with a volume of 120 % of the largest single storage container or 25 % of the total storage containers, whichever is greater.	CONTRACTOR -ECO	-MME -MEFT, -MAW&LR -MHSS
Surface and Ground Water Impacts	No perennial water body is present in proximity to the mine. • It is recommended that Industrial Minerals (aggregate) mining takes place outside of the rainy season to limit erosion & flooding on site and surface water pollution. • No dumping of waste products of any kind in or near surface water bodies.	CONTRACTOR -ECO	-MME -MEFT, -MAW&LR -MHSS

Aspect	Management Actions	Responsibility	Monitoring Agent (s)
	• Heavy duty vehicles should be kept out of any surface water bodies and the movement of vehicles should be limited where possible to the existing access roads and tracks. The stationary plant must be fitted with drip trays to avoid groundwater contamination. • Contaminated runoff from the sites should be prevented from entering the surface water bodies. • Workers should be given ablution facilities at the sites that are located at least **30 m** away from any surface water and regularly serviced. • Washing of personnel or any equipment should not be allowed on site.		
Topsoil	• When excavations are carried out, topsoil[2] should be stockpiled in a demarcated area and used in profiling and rehabilitating of the depleted, open quarries at the mining sites. • Stockpiled topsoil should be used to rehabilitate post-harvesting degraded areas and/or other nearby degraded areas within the Ovikokola Village in consultation with the Traditional Authority.	CONTRACTOR -ECO	-MME -MEFT, -MAW&LR
Soil Erosion	• Clear the vegetation of the project area in phases during the aggregate mining period to keep the soil more compacted as well as to limit overall disturbance to the area over time.	CONTRACTOR -ECO	-MME -MEFT, -MAW&LR -MHSS

[2] Topsoil is defined here as the top 150mm of surface material, which accounts for the seedbank.

Aspect	Management Actions	Responsibility	Monitoring Agent (s)
	• It is recommended that most aggregate mining takes place outside of the rainy season in order to limit potential flooding and the runoff of loose soil causing further erosion. • Appropriate erosion control structures must be put in place where soil may be prone to erosion. • Checks must be carried out at regular intervals to identify areas within the mining site where erosion is occurring. Appropriate remedial actions are to be undertaken wherever erosion is evident.		
Rehabilitation	• Upon completion of the industrial mineral (aggregate) mining phase consultations should be held with the local community/property owner(s) regarding the post-aggregate mining use of remaining excavated areas (if applicable) and to identify priority areas. • Sand/waste rock at the site should be levelled so it can be reclaimed for other purposes once the aggregate mining has ceased and rather than leaving the quarries open which will pose a threat to people and animals in the area. • In the event that no post-operation uses are requested, all excavated/degraded areas need to be rehabilitated as follows:	CONTRACTOR -ECO	-MME -MEFT, -MAW&LR -MHSS

Aspect	Management Actions	Responsibility	Monitoring Agent (s)
	o Excavated areas may only be backfilled with clean or inert fill. No material of hazardous nature (e.g., sand removed with an oil spill) may be dumped as backfill. o Rehabilitated excavated areas need to match the contours of the existing landscape. o The rehabilitated area should not be higher (or lower) than nearby drainage channels. This ensures the efficiency of re-vegetation and reduces the chances of potential erosion. o Topsoil is to be spread across excavated areas evenly. o Deep ripping of areas to be rehabilitated is required, not just simple scarification, to enable rip lines to hold water after heavy rainfall. o Ripping should be done along slopes, not up and down a slope, which could lead to enhanced erosion.		
HIV/AIDS and TB awareness	• The Contractor should approach the Ministry of Health and Social Services to co-opt a health officer to facilitate HIV/AIDS and TB education programmes periodically on site during the project operation. • A wellness program should be initiated to raise awareness on health issues, especially the impact of sexually transmitted diseases.	CONTRACTOR	-ECO -MME -MEFT, -MAW&LR -MHSS

Aspect	Management Actions	Responsibility	Monitoring Agent (s)
	• Provide free condoms in the workplace and to local community throughout project operation. • Facilitate access to Antiretroviral medication. • Personnel should not overnight at the aggregate mining sites, but only the security personnel.		
Road safety	• Demarcate roads clearly. • Off-road driving should not be allowed. • All vehicles that transport materials to and from the site must be roadworthy. • Drivers that transport materials should have a valid driver's license and should adhere to all traffic rules. • Loads upon vehicles should be properly secured to avoid items falling off the vehicle. • Limit and control the number of access points to the mining site. • The road leading to the mining sites should be properly maintained so as to reduce dust emissions when heavy vehicles travel on them.	CONTRACTOR -ECO	-RA -MME -MEFT, -MAW&LR -MHSS
Safety around work sites	• Excavations/quarries should be left open for the shortest time possible. • Excavate short lengths of trenches and box areas for services or foundations in a manner that will not leave the trench unattended for more than 24 hours. • Demarcate excavated areas and topsoil stockpiles with danger tape.	CONTRACTOR -ECO	-MME -MEFT, -MAW&LR -MHSS

Aspect	Management Actions	Responsibility	Monitoring Agent (s)
	• Provide additional warning signage in areas of movement and in "no personnel" areas where workers are not active. • Quarries are to be fenced-off with stock-proof perimeter fencing. • Work areas must be set out and isolated with danger tape on a daily basis. • All materials and equipment are to be stored only within set out and demarcated work areas. • Only aggregate mining personnel will be allowed within these work areas. • 2 fire extinguishers or more should be available at fuel storage areas. • Comply with all waste related management actions stated above in this table.		
Ablutions	• Separate toilets should be available for men and women and should clearly be indicated as such. • Portable toilets (i.e., easily transportable) should be available at the quarry site: o 1 toilet for every 15 females. o 1 toilet for every 30 males. o Sewage needs to be removed on a regular basis to an approved (municipal) sewage disposal site in Omaruru. Alternatively, sewage may be pumped into sealable containers and stored until it can be removed, alternatively	CONTRACTOR	-ECO -MME -MEFT, -MAW&LR -MHSS

Aspect	Management Actions	Responsibility	Monitoring Agent (s)
	○ Septic tanks and soak pits will be provided for the disposal of domestic/ washrooms effluents. ○ Workers responsible for cleaning the toilets should be provided with latex gloves and masks.		
Open fires	No open fires may be made anywhere on the mining site.	CONTRACTOR	-ECO -MME -MEFT, -MAW&LR -MHSS
General health and safety	• A fully stocked first aid kit (with unexpired medicines, include a snake bite kit) should permanently be available on-site as well as an adequately trained member of staff capable of administering first aid. • All workers should have access to the relevant personal protective equipment (overalls, hard toe boots, goggles, dust masks, sun hats heavy duty gloves etc.). • Sufficient potable water reserves should be available to workers at all times. • No person should be allowed to smoke close to fuel storage facilities or portable toilets (if toilets are chemical toilets – the chemicals are flammable). • No workers should be allowed to drink alcohol during work hours. • No workers should be allowed on the mining sites/quarries if under the influence of alcohol.	CONTRACTOR	-ECO -MME -MEFT, -MAW&LR -MHSS -SSC

Aspect	Management Actions	Responsibility	Monitoring Agent (s)
Dust	• A watering truck should be used on gravel roads with the most frequent vehicle movement especially during dry and windy conditions. However, due consideration should be given to water restrictions during times of drought. • The use of waterless dust suppression means (e.g., lignosulphonate products such as Dustex) should be considered. • Cover any stockpiles with plastic to minimise windblown dust. • Dust protection masks should be provided to workers if they complain about dust. • During high wind conditions the contractor must make the decision to cease works until the wind has calmed down.	CONTRACTOR	-ECO -MME -MEFT, -MAW&LR -MHSS
Noise	Work hours should be restricted to between **08h00 and 17h00** where excavation involving the use of heavy equipment, power tools and the movement of heavy vehicles is less than 500 m from residential areas. If an exception to this provision is required, all residents and business owners within the **500 m** radius should be given 1 week's written notice. ➢ If workers are to be exposed to noise levels above 85dB for continuous extended periods of more than two hours, they are to be provided with ear muffs and allowed to take 10-15 minute breaks away from the noise source.	CONTRACTOR	-ECO -MME -MEFT, -MAW&LR -MHSS

Aspect	Management Actions	Responsibility	Monitoring Agent (s)
	• Optimum placement of waste dumps, location of haul roads, location of fixed plant loading hoppers. Waste dumps, stockpiles can be used to shield fixed items of plant which generate noise.		
Vibration Management	Vibrations caused during drilling or blasting operations may be managed by: • Reducing the maximum instantaneous charge (MIC) by using delays, reduced hole diameter and/or deck loading • Drilling & blasting will be carried out in small scale only to develop cracks in the parent rock mass. • Changing the burden and spacing by: altering the drilling pattern, and/or delay layout, or altering the hole inclination. • Exercising strict control over spacing and orienting all blast drill holes. • Establish times of blasting to suit local conditions.	CONTRACTOR	-ECO -MME -MEFT, -MHSS
Recruitment of labourers	The Contractor should compile a formal recruitment process including the following provisions as a minimum: • Adhere to the legal provisions in the Labour Act No. 11 of 2007 for the recruitment of labour (target percentages for gender balance, optimal use of local labour and SME's, etc.).	CONTRACTOR	-ECO -MME -MEFT, -MAW&LR -MHSS -SSC

Aspect	Management Actions	Responsibility	Monitoring Agent (s)
	• Recruitment should not take place at the aggregate mining site. • Ensure that all sub-contractors are aware of recommended recruitment procedures and discourage any recruitment of labour outside these agreed upon procedures. • All contractors should give preference in terms of recruitment of sub-contractors and individual labourers to those who are qualified and from the project area and only then look to surrounding towns. • Clearly explain to all job-seekers the terms and conditions of their respective employment contracts (e.g. period of employment etc.) – make use of interpreters where necessary.		
Communication plan	The Contractor or PR should draft a Communication Plan, which should outline as a minimum the following: • How Interested and Affected Parties (I&APs), who require on-going communication for the duration of the operation period, will be identified and recorded and who will manage and update these records; • How these I&APs will be consulted on an on-going basis;	CONTRACTOR -ECO	-MME -MET, -MAW&LR -MHSS -SSC

Aspect	Management Actions	Responsibility	Monitoring Agent (s)
	• Make provision for grievance mechanisms – i.e., how concerns can be lodged/ recorded and how feedback will be delivered as well as further steps of arbitration in the event that feedback is deemed unsatisfactory.		
General communication	• The PR must appoint an ECO to liaise between the Contractor, I&APs and M. Shikongo's Investments Group One (Pty) Ltd 's management. • The Contractor shall at every bi-monthly site meeting report on the status of the implementation of all provisions of the EMP. • The Contractor should implement the EMP awareness training as stipulated above in this table. • The Contractor must list the I&APs of the project and their contact details with whom on-going communication would be required for the duration of the contract. This list, together with the Communication Plan must be agreed upon and given to the PR before operation commences/resumes. • The Communication Plan, once agreed upon by the Developer, shall be legally binding. • A copy of the EMP must be available at the site office and should be accessible to all I&APs.	CONTRACTOR	-ECO -MME -MEFT, -MAW&LR -MHSS

Aspect	Management Actions	Responsibility	Monitoring Agent (s)
	• Key representatives from the above-mentioned list need to be invited to attend monthly site meetings to raise any concerns and issues regarding progress to rehabilitate the excavated areas and surrounding quarries. • The Contractor should liaise with the proponent regarding all issues related to community consultation and negotiation before operation commences/resumes. • A procedure should be put in place to ensure that concerns raised have been followed-up and addressed. • All people on the I&APs list should be informed about the availability of the complaints register and associated grievance mechanisms in writing by the PR prior to the commencement of site activities.		
Archaeology	• Should a heritage site or archaeological site be uncovered or discovered during the Industrial minerals (aggregate) mining phase of the project, a "chance find" procedure should be applied in the order they appear below: o If operating machinery or equipment stop work; o Demarcate the site with danger tape; o Determine GPS position if possible; o Report findings to the site foreman;	CONTRACTOR	-ECO -NHC -MEFT, -MAW&LR -MHSS

Aspect	Management Actions	Responsibility	Monitoring Agent (s)
	○ Report findings, site location and actions taken to superintendent; ○ Cease any works in immediate vicinity; ○ Visit find site and determine whether work can proceed without damage to findings; ○ Determine and demarcate exclusion boundary; ○ Site location and details to be added to a Geographic Information System (GIS) for field confirmation by archaeologist; ○ Inspect site and confirm addition to dimension stone mining site GIS; ○ Advise the National Heritage Council (NHC) and request written permission to remove findings from work area; and ○ Recovery, packaging and labelling of findings for transfer to National Museum. • Should human remains be found, the following actions will be required: ○ Apply the chance find procedure as described above; ○ Schedule a field inspection with an archaeologist to confirm that remains are human; ○ Advise and liaise with the NHC and Police; and ○ Remains will be recovered and removed either to the National Museum or the National Forensic Laboratory.		

3.5 QUARRY REHABILITATION PHASE (Continuous)

The management actions included in **Table 4** below applies during the continuous quarry rehabilitation phase of the mining operations and should be undertaken together with the mitigation measures in **Table 3** above.

Table 4: Quarry Rehabilitation Phase Management actions

Environmental Feature	Management Actions	Responsibility	Monitoring Agent
EMP training	All contractors appointed for the transportation of the aggregate on mining site on mining claims; 71427, 71428, 71429 & 71430 situated at Ovikokola Village, Ruacana Constituency must ensure that all personnel are aware of necessary health, safety, and environmental considerations applicable to their respective work.	CONTRACTOR	-ECO -MEFT, -MME, -SSC.
Monitoring	The ECO should monitor the implementation of the EMP: • The ECO should regularly inspect the conditions around the aggregate mining & stone crushing site before work starts; and • The ECO should inspect the mining & crushing site at the end of each extraction & crushing period.	CONTRACTOR	-ECO

Environmental Feature	Management Actions	Responsibility	Monitoring Agent
Water and waste management	• Ensure that the infrastructure at the milling/crushing site is connected to the mining site drainage and wastewater reticulation. • Regular preventative maintenance should be carried out on the infrastructure to ensure that risks of overspills/leakages are minimised. • A no-go buffer area of at least **30 m** should be allocated to any water bodies in the area. • No dumping of waste products of any kind in or in close proximity to any surface water bodies. • Sufficient weather and scavenger-proof bins (with lids, to prevent the escape of litter) shall be provided, and be easily accessible at all points where wastes are generated.	CONTRACTOR	-ECO -MEFT, -MAW&LR -MHSS

Environmental Feature	Management Actions	Responsibility	Monitoring Agent
	• The site shall be kept clean and free of litter and no litter from the site shall be allowed to disperse to surrounding areas. • All personnel shall be instructed to dispose of all waste in the proper manner. • The Contractor shall identify and separate materials that can be reused or recycled to minimise waste e.g., metals, packaging, and plastics, and provide separate marked bins for these items. • All materials (e.g., explosive cartridges) must be suitably stored and protected, so that they do not become damaged and unusable.		

Environmental Feature	Management Actions	Responsibility	Monitoring Agent
	• The Contractor shall be responsible for the regular disposal (at suitable and licensed municipal waste disposal facilities) of all waste generated as a result of the aggregate mining and crushing. • Contaminated runoff from the various operational activities should be prevented from entering any surface water bodies. • Ensure that surface water accumulating on-site are channelled and captured through a proper storm water management system to be treated in an appropriate manner before disposal into the environment. • Disposal of waste from the properties should be properly managed. • No waste may be burned on site.		

Environmental Feature	Management Actions	Responsibility	Monitoring Agent
	• General waste is to be collected either by the local Municipality or removed by the proponent. • The frequency of collections will be such that waste containment receptacles do not unduly accumulate or overflow.		
Energy efficiency	• The use of solar energy should be encouraged to provide for general lighting and heating of water and buildings. • The use of water saving initiatives should be incorporated within the workers' prefabricated housing design in order to reduce water demand.	CONTRACTOR	-ECO -MEFT, -MAW&LR

3.6 DECOMMISSIONING PHASE

Mine closures can be planned for and should form part of an integrated land use strategy that involves the Traditional Authority and their subject community. The decommissioning of the aggregate mining at the 4 mining claim sites (i.e., 71427, 71428, 71429 & 71430) is envisaged in the future. Planned closure, in consultation with the community/ Traditional Authority, provides the opportunity to develop alternative land uses through rehabilitation, and to use the remaining infrastructure for other economic purposes such as livestock farming. When the event occurs, some recommendations have been outlined in **Table 5**.

Table 5 is a guideline to the decommissioning plan, whereby an active care mine closure is going to be implemented.

Table 5: Decommissioning plan

Decommissioning Phase			
Possible Impact	**Mitigation**	**Responsibility**	**Monitoring Agent**
Physical/Biological -Land degradation& loss of aesthetic value	-Establish a vegetation cover as soon as possible (stabilization) -Vegetate cleared area with indigenous trees -Fencing of the dangerous areas	CONTRACTOR	-ECO -MEFT, -MAW&LR
-Injury to people and livestock	-Complete filling up of the trenches -Barricade the old workings with concrete -Fencing of the dangerous areas	CONTRACTOR	-ECO -MEFT, -MAW&LR
-Contaminated surface and underground water. -Soil pollution. -Acid water drainage	-clean up spills (chemicals, diesel and oil) -Water quality analysis. -Monitor soil and water quality for a specified time after closure.	CONTRACTOR	-ECO -MEFT, -MAW&LR
Resurgence of hazardous chemicals	-Treatment of hazardous chemicals (if any) -Neutralization -Precipitation, oxidation, reduction and acid/alkali hydrolysis	CONTRACTOR	-ECO -MEFT, -MAW&LR -MHSS
Accumulated solid waste	-Disposal of solid waste through source sorting, recycling, aerobic decomposition (composition), incineration or depositing in land fill and covering of land fill	CONTRACTOR	-ECO -MEFT, -MAW&LR -MHSS
Loss of biodiversity	-Eliminate environmental damage through reclamation. -Site restoration through regeneration of woodland. -Restore chemical, biological and physical stability of site. -Allow productive land use.	CONTRACTOR	-ECO -MEFT, -MAW&LR

Compacted soil	-Rehabilitate areas affected by excessive soil compaction and oil spillage	CONTRACTOR	-ECO -MEFT, -MAW&LR -MME
Social/Economic -Laying off workers -Loss of income -Drop in the standard of living	-Catering of welfare of laid off workers -Pension schemes -Creation of income generating projects for laid off workers -Secure alternative employment for workers	CONTRACTOR	-ECO -SSC
-Infrastructure may become derelict -Derelict building may detract from the value of surrounding properties	-Return of community access to infrastructure -Educate locals on the utilization of the infrastructure -Considering promoting water reservoir for fishing	CONTRACTOR	Ministry of Works and Transport
-Possible outbreaks of diseases	Educate communities on dangers of STIs and waterborne diseases	CONTRACTOR	Ministry of Health & Social Services(MHSS)
Damaged roads	Repair damaged roads	CONTRACTOR	-Roads Authority

In addition to the plan above, decommissioning should also be carried out as per the following guidelines:

- The Proponent/Owners and Managers of the mines should be capable of implementing responsible environmental management practices. The preparation of environmental management plans will facilitate this process and is strongly encouraged.
- All mined sites should be rehabilitated either progressively or at the end of mining. Each mining site should be left in a safe well drained and maintenance-free state, blending in as much as possible with the surrounding landscape.
- Mine operators should ensure that funds are available for progressive and final site (closure) rehabilitation.
- Unless otherwise approved (by an Inspector of mines) at mining closure, all machinery structures and buildings should be removed from the site and concentrate slabs broken up and buried. The site should be ripped; top soiled (if available), fertilized and re-vegetated using indigenous plant species. Alternatively, if approved, certain structures can remain for the benefit of the next land user.
- Surface and ground waters should be effectively managed to prevent contamination of mining operations.

- Effluent from mining and crushing operations should be effectively contained and only released into river systems if the water quality satisfies the standards of the **Water Quality Guidelines (Annexure B)**.

- Measures to be taken to control noise and dust from mining/milling/hauling operations to ensure a comfortable and health working environment as specified in the **Labour Act No. 11 of 2007.**

- Measures should be taken to minimise excessive ground vibrations and air-blasts over pressure due to blasting. Peak particle velocities of 5 mm/sec and air-blasts over pressures of 120 dB (peak) should not be exceeded at the boundaries of the mining area.

- Mine operators should ensure that refuse is deposited in proper containers and disposed of responsibly. Fuel and oil spills should be effectively contained.

- Where practical, buildings, processing plant, stockpiles and waste dumps should be designed and located to reduce visual impact. Advantage should be taken of natural topography and exciting vegetation and if this not a practical option, a screen of trees should be established.

- Measures should be taken to prevent or minimise soil erosion.

- As far as is practical, top soil should be stripped from all areas to be distributed by mining operations/milling and used immediately if possible or preserved for later rehabilitation.

- Areas disturbed by mining should be re-vegetated as far as is practical using indigenous grass or tree species. However, on sites such as tailings/waste dumps, where it is important to establish a vegetative cover as soon as possible on difficult growing mediums, the use of fast growing exotic species is acceptable .Care should be taken to prevent the entry and spread of noxious plants.

- Explosives, hydrocarbon fuels and other toxic materials should be transported stored and handled in a safe and acceptable manner. They should be stored in safe place, fenced to prevent entry of unauthorised persons. The owner /manager should ensure that toxic materials do not escape into the surrounding rivers/ground waters.

- Mine operators should strive to conserve local flora and fauna species and avoid unnecessary destruction of both.

- Unique archaeological, historical, geological and scenic features should be protected at all mining and exploration sites.

- Residents in the vicinity of a mine should not be subjected to excessive airborne emissions (including dust, gases and smokes), liquid effluent, noise, ground vibrations and air blast from mining /haulage operations.

- Mine tailings and slimes should be disposed of/stored in impoundments constructed in accordance with sound engineering principles. The dams should be sited to avoid the encountering of permeable sub-soil and/or fracture systems and an adequate drainage system should be incorporated in the design. They should be sited so that their catchments are minimal and should be designed to withstand significant rainfall events.

- Unless otherwise approved, at the cessation of mining, or earlier if practical, waste rock dumps should be stabilized by reducing the slope angle and re-vegetated. Topsoil should be used if practicable.

- All shafts not being used should be securely capped/otherwise made safe to prevent the entry of persons/livestock.

- The final land use of open cast mine /quarry should be determined prior to the cessation of mining. For example, if the site is to be used for water storage, then at the end of the mine life, drainage could be directed into the pit. If the pit/quarry is to be used for any other purpose then drainage should not be diverted around the site.

- The final land use will dictate the amount of reshaping required on the pit faces. Where practical the slope of the steep faces should be reduced and benches top soiled (if available) to facilitate re-vegetation and blending with the surrounding landscape.

- If practical quarry faces should be oriented to minimise their visual impact from public areas.

- Dangerous excavations should be made safe to prevent entry of persons/livestock.

- In strip mining operations, overburden material, which is adverse to plant growth, should be buried and every effort should be made to recover and store top soil from mining path for later rehabilitation.

- Mine rehabilitation should be carried out progressively to ensure that a minimum of ground is disturbed at any one time. A maximum of 2 hectares shall be un-rehabilitated at any one time unless otherwise approved.

- The mining and rehabilitation method should ensure each layer disturbed should be replaced to its original sequence at topsoil as its final layer. All disturbed areas should be progressively rehabilitated.

- All exploration drill holes should be capped, plugged/filled in, either progressively or at the end of the program.

- All drilling sites, trenches and pits should be rehabilitated (i.e. backfilled and re-vegetated) after the cessation of exploration activities on resource poor sites prior to active mining.

- Each mining claim site should be left in a clean and tidy condition with all refuse removed.

Mine closures can be planned for and should form part of an integrated land use strategy that involves the Traditional Authority and their subject community. The decommissioning of the aggregate mining at the 3 mining claim sites is envisaged in the future. Planned closure, in consultation with the Traditional Authority and their subject community, provides the opportunity to develop alternative land uses through rehabilitation, and to use the remaining infrastructure for other economic purposes such as livestock farming or charcoal production. When the event occurs some recommendations have been outlined in **Table 6**.

Table 6: Decommissioning phase management actions

Environmental Feature	Management Actions
Deconstruction activity	Many of the mitigation measures prescribed for the aggregate mining & quarry rehabilitation activities (**Table 3-5** above) would be applicable to some of the decommissioning activities. These should be adhered to where applicable.
Rehabilitation	In the event that decommissioning is deemed necessary, excavations need to be rehabilitated according to the management actions laid out in **Table 3-5** above.

ANNEXURE A: PREVIOUSLY ISSUED ECC

Serial: TNbFyN6S5

REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

ENVIRONMENTAL CLEARANCE CERTIFICATE

ISSUED

In accordance with Section 37(2) of the Environmental Management Act (Act No. 7 of 2007)

TO

M. Shikongo's Investments Group One (Pty) Ltd
P. O. BOX 2498, Walvis Bay

TO UNDERTAKE THE FOLLOWING LISTED ACTIVITY

Establishment of a Quarry and Stone Crushing Plant on Mining Claim No. 71427 - 71430 at Ovikokola Village, Ruacana Constituency, Omusati Region.

MINISTRY OF ENVIRONMENT FORESTRY AND TOURISM
Private Bag 13306
WINDHOEK NAMIBIA
02 JUN 2020
ENVIRONMENTAL COMMISSIONER
ENVIRONMENTAL COMMISSIONER
REPUBLIC OF NAMIBIA

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ANNEXURE B: SITE PHOTO GALLERY


M. SHIKONGO'S INVESTMENT
GROUP ONE
PROSP. LICENSE NO. 8467
ORDINAL NO. 4
PEGGED 10.08.2023
CORNER BEACON